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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/736,181	12/15/2000	Jean-Pierre Balech	Q62176	8795

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EXAMINER

TRAN, KHANH C

ART UNIT PAPER NUMBER

2631

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/736,181

Applicant(s)

BALECH, JEAN-PIERRE

Examiner

Khanh Tran

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/15/2000.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

1. The Amendment filed on 02/17/2005 has been entered. Claims 1-6 are pending in this Office action.

Response to Arguments

2. An initialed copy of Form PTO-1449 filed with the Application on 12/15/2000 was sent out with an Office action on 09/24/2003. However, because Applicant requested again the initialed copy, a copy of the initialed copy is sent out with this Office action.

3. The objection of the Abstract and the Specification has been withdrawn after Applicant's clarification.

4. Applicant's arguments filed on 02/17/2005 have been fully considered but they are not persuasive. Below is the following explanation including responses to Applicant's newly added limitations and Applicant's argument.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2631

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Billström U.S. Patent 5,983,101.

Regarding claim 1, Billström invention comprises two parts: first part describes situations of possible interference in a point to multipoint system as illustrates in figures 1 and 1A, second part showing steps of network planning processor according to Billström teachings.

Regarding to the claimed preamble: In column 3, line 4 through column 4 line 15, figure 1 shows a microwave coverage network 20. Network 20 includes a regular pattern of base station sites and the corresponding cell or coverage area for each base station site is shown as a square, with a base station site being located at the center of the square. As illustrates in figure 1, terminal T1 is located in sector $S4_{c1}$, which is served by base station B1-4 (see figure 1A). Base station B1-4 corresponds to the claimed first base station.

Figure 1 only shows one terminal T1 is located in sector $S4_{c1}$. However, the base station B1-4 is connected by a plurality of subscriber terminals located within respective coverage areas of the base station B1-4, wherein at least some of the plurality of radio links being within a same frequency band, in another word, the same channel as appreciated by one of ordinary skill in the art. The plurality of subscriber terminals operating on the same channel corresponds to the claimed end-users communicating with the base station over a first channel.

In the method of allocating radio link characteristics in a point to multipoint radio access system shown in figure 4A, each of the plurality of modulation types is determined for maximum range. Then, each of the plurality of subscriber terminals corresponding to a respective radio link is allocated a modulation type dependent upon range from the base station B1-4. In light of the foregoing teachings, subscriber terminals using the same modulation type experience the same interference level.

Further in column 3 line 30 via column 4 line 2, referring to figure 1, terminal T1 in sector S4_{C1}, corresponding to the claimed an end-user, may experience interference from a terminal T2, corresponding to the claimed distant end-user, located in S4_{C2} if both terminals T1 and T2 uses the same frequency f1. Terminal T2 causes interference in base station B1-4 because terminal T2 has a narrow antenna beam which is directed towards its own base station B2-4 and terminal T2 is more or less in line with both base stations B2-4, which corresponds to the claimed distant base station, as well as with base station B1-4 in the manner shown in figure 1.

Regarding to the claimed step of determining the size and location of at least one domain in the cell as set forth in the application claim:

Billström does not teach the claimed step as recited above. Figures 4A and 4B, are flowcharts showing steps executed by a network planning processor 110 according to an embodiment. Inputs to Network planning processor 110 includes the *locations of the base stations B and the terminals T*, the *particular antenna patterns employed*, basic link parameters and modulations sensitivities such as carrier-to-noise ratio (C/N) and carrier-to-interference ratio (C/I), see column 4, lines 55-67.

At step 405, see column 6, lines 20-40, a maximum range is calculated for each of various modulation types, e.g. Table I. As disclosed in step 408, for each terminal, a calculation is performed of the C/I ratio, wherein *the interference from all other base stations* is calculated taking the polarizations, *antenna patterns* and the interferences are added together to obtain "I" of the C/I ratio, see column 6, lines 45-67.

Billström does not expressly include interference from terminals T2, corresponding to distant end-users, more or in line with both base station B2-4 as well as with base station B1-4 in the calculation of interference "I". Nevertheless, because Billström discussed that particular situation if terminals T1 and T2 are assigned the same frequency, a potential interference problem would arise as shown in figure 1; see also in column 3, lines 45-67, it would have been obvious for one of ordinary skill in the art at the time the invention was made that calculation of interference "I" can be modified to include interference from any distant terminal T2 using the same frequency.

At step 410, in column 6, lines 53-67, for each terminal the calculated C/I is checked to determine if it is greater than the minimum required C/I. If the required C/I is not satisfied when checked at step 410, the next lower (more robust modulation type) is selected for that terminal (step 412). In light of the foregoing teachings, terminals having relatively same interference are assigned the same modulation type. The size and location of the claimed domain depends on those terminals having relatively same interference. Therefore, one of ordinary skill in the art would have recognized that the claimed step of determining the size and location of at least one domain in the cell is encompassed in Billström teachings as part of the network planning.

Regarding to the claimed step of assigning a second modulation type to at least one domain in the cell as set forth in the application claim:

in column 6 line 54 through column 7 line 12, at step 410 of the method in figure 4B, the calculated C/I ratio as recited above is checked to determine if it is greater than the minimum required C/I, which corresponds to the claimed predetermined interference level. If the required C/I is not satisfied, meaning calculated C/I being lower the minimum required C/I, the next lower modulation type (more robust modulation type) is selected for that terminal at step 412. Hence, all terminals having the same C/I are assigned the same next lower modulation type, which corresponds to the claimed a second modulation type.

Regarding to the claimed step of wherein end-users located in the domain communicate with the base station using the second modulation type over a second communication, said second modulation type having high efficiency than the first modulation type:

as recited above, the next lower modulation type (more robust modulation type) is selected. Because the lower modulation type is robust due to lower interference level, the modulation type has higher efficiency than the first modulation type. Billström does not expressly teach using a second modulation type over a second communication channel. However, expressed in column 9, lines 25-40, the invention also applies to a system with dynamic channel allocation, and the links can operate in *more than* one frequency band. In view of that it would have been obvious for one of ordinary skill in the art at the time the invention was made that the second modulation can be modified

to operate over a second communication channel. The motivation is obvious that terminals using the same frequency over the same channel cause interference. Moving the users to different channel would alleviate that.

Regarding claim 2, Billstrom discloses that terminals are located at premises of customers. Hence, the terminals are fixed terminals. Furthermore, as recited in claim 1, due to interference level check for unsatisfied C/I level, terminals may be switched to the lower modulation type, which are more robust than the first modulation type. That step corresponds to the claimed step of *"configuring end-users to use only the second modulation type if end-users are located in the at least one domain in which the interference level is lower than the predefined interference level"*. According to the network planning flowcharts in figures 4A and 4B, each terminal is assigned a modulation type depending on the C/I level, range to the base station, interference from other distant base stations, other distant end users more or less in line with both base stations as depicted in the example of figure 1. Hence, terminals T1, which don't have the same C/I level as recited above, can be configured to use the same modulation type, corresponding to the claimed first modulation type. Because other terminals T1 do not have the same C/I level, terminals T1 are not located in the same domain as claimed. In view of that, the foregoing discussion addresses the claimed limitation *"configuring the end-users to use only the first modulation type if the end-users are not located in said at least one domain"*.

Regarding claim 3, claim 3 only differs from claim 2 in that the end-users are mobile terminals. Billstrom does not teach the end-users are mobile terminals. However, one of ordinary skill in the art will recognize that Billstrom teachings would apply as well to the case in which terminals are mobile users for the following reasons: Billstrom invention applies to a system with dynamic channel allocation (see column 9, lines 25-30), dynamic bandwidth allocation mode (see column 5, lines 5-15). In column 8, lines 23-45, a new terminal can be added to the system and the network planning processor 210 executes the same method to determine the modulation type, bandwidth, and frequency use for the new terminal. Furthermore, in dynamic bandwidth allocation mode, modulation type is done momentarily by the control unit 70 in the sector. In light of the foregoing disclosure, all functionalities of the network planning processor would not only perform on fixed terminals, but also on mobile terminals. The other limitations of claim 3 are rejected on the same ground as for those of claim 2 because of similar scope.

Regarding claim 4, Billstrom does not teach the first modulation type is 4QAM and the second modulation type is 16QAM. However, Billstrom invention gives five different examples of modulation types and correspondent characteristics shown in Table I in column 5. A person of average skill in the art will recognize that Billstrom invention is not limited to the five different examples of modulation types. According to Billstrom teachings, the allocation of a modulation type for each terminal is part of the network planning, and can be adaptively change to make optimum usage of the total

bandwidth. In view of that, utilization of 4QAM for a first modulation type and 16QAM for a second modulation type can be implemented as part of the network planning by the network planning processor 110 as taught in Billstrom invention.

Regarding claim 5, Billstrom expresses that the radio links between subscriber terminals and base stations all work within the same frequency band, see column 8, lines 45-65. In view of that, the channels in figure 1 are channels of frequency.

Regarding claim 6, claim 6 is rejected on the same ground as for claim 1 because of similar scope. Every limitation of claim 6 has been discussed in claim 1 above. Furthermore,

The microwave coverage network in figure 1 corresponds to the claimed cellular radio-communication system.

As recited in claim 1, referring to figure 1, terminals having the same C/I level are assigned the same modulation type. The location and size of the terminals constitute the claimed at least one domain.

Referring to figure 1, base station B1-4 corresponds to the claimed first base station. Terminal T1 represents one of end-users communicating with the first base station by using a modulation type, corresponding to the claimed first modulation type, over first communication channel.

Referring to figure 1, terminal T2, corresponding to the claimed at least one distant base station, cause interference in base station B1-4, corresponding

to the claimed first base station, and terminal T1 while communicating with base station B2-4, corresponding to the claimed at least one distant base station using the same channel frequency.

The size and location of the at least one domain is encompassed in Billström teachings and are discussed in claim 1 rejection.

The claimed limitation "*wherein, when end-users are located in said at least one domain of said cell and said interference level is lower than a predefined interference level ...*" are also discussed in claim 1 rejection as recited above.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT


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